

REVIEW

of the Dissertation by Todor Minkov Todorov entitled:

Methodology of Physical Training of Rope Access Technicians

for award of PhD educational and scientific degree, scientific specialty “Theory and Methodology of Physical Education and Sports Training” in Professional Field 7.6 Sports

Research supervisor: Assoc. Prof. Alexander Shopov, PhD

Reviewer: Prof. Malcho Malchev, PhD

Grounds for drawing up the Review: Order No. ZP 1075/20.10.2022 by the Rector of the National Sports Academy “Vassil Levski”. The Review was prepared in accordance with the Act on Development of the Academic Staff in the Republic of Bulgaria and the Rules for its Application, the standard form and content for reviews during the public defense of dissertations, and the Ordinance for the acquisition of the PhD educational and scientific degree at the National Sports Academy “Vassil Levski”.

1. PhD student and PhD program details

Todor Minkov Todorov was born on October 7, 1962 in Pernik. After completing his secondary education at the Vocational School of Construction and Architecture “Vlado Trichkov” in Tran in 1980, later on, in 1991 he graduated from the Higher Institute of Physical Education and Sports “G. Dimitrov”/National Sports Academy “Vassil Levski”.

His professional career is, as follows: from 1990 to 1993, alpinism coach at TS “Krakra Pernishki”; from 1997 to 1998, alpinism coach at TS “Chavdar”, at MP Kremikovtsi, and from 2015 to 2016, part-time lecturer at the National Sports Academy “Vassil Levski”.

Current pedagogical activity: works on a main employment contract as a lecturer in “Tourism, Mountaineering and Orienteering” Department at the “Public Health, Healthcare and Tourism” Faculty.

Public-administrative and sports activities: from 1990 to 1993, he was a member of the Alpinism Committee at the Bulgarian Alpine Club (BAC). His long-standing sports activity is related to mountaineering: wall climbing; combined ascents in the Alps and Caucasus, and high-altitude expeditions and ascents in: Pamir, Tien Shan and Himalayas, and Karakorum. He was a member of the national teams of Bulgaria in rock climbing and mountaineering. I note this aspect of Todor Todorov’s biography because it sufficiently reveals and proves the multitude of sports and technical competences that he possesses. This, on the other hand, facilitates him in the practical-applied aspects of the research activity related to the dissertation.

Todor Minkov Todorov is enrolled as a PhD student on a self-study basis in the higher education field 7. Healthcare and sports, professional field 7.6.

Sports, PhD program “Theory and Methodology of Sports Science” at the “Tourism, Mountaineering and Orienteering” Department with a 3-year duration of study, pursuant to Order No. ZP-835/30.04.2018. By Order No. ZP-579/20.05.2021 he was discharged with the right of defence.

2. Dissertation details

The theme of the dissertation is markedly *topical*. It corresponds to the specific activities of climbers and cavers in the field of road construction, restoration and installation works on high sites. This activity has begun in our country in the middle of the 20th century. Today, however, we can confidently claim that we are witnessing a boom of this type of business.

Actuality is also preconditioned by other determinants. Among those, the topic of and legal requirements for healthcare and safety working conditions in the use of rope access technologies stand out with particular urgency. We have witnessed a series of occupational accidents, some of which with a tragic outcome for the practitioners of this profession. The reason for this is the lack of the necessary competences of the so-called “height technicians” (knowledge, skills and attitudes towards safety) and to a very large extent, their inadequate psychophysical training. In this regard, as a person with long-standing company commitments in the discussed labor and professional area, and with scientific knowledge of the problems, I welcome the lecturer Todor Todorov and his scientific supervisor, Associate Professor Alexander Shopov, PhD, for choosing the topic of the discussed dissertation.

2.2. General description of the dissertation

As can be seen from the title, the dissertation presented is dedicated to a significant and debatable issue related to the development and verification of an innovative proprietary program and methodology for specific physical training of people employed in professions that require the implementation of the “Rope Access” technology. To a certain extent, the dissertation is difficult to understand at first sight, due to the specifics of the issues and the number of generally used new concepts from a sportological perspective; however, the generalizations, conclusions and recommendations made protect its innovative scientific communicability and value.

2.2. Evaluation of the structure and content of the dissertation

The content of the work submitted for review is traditional. Structurally and in terms of volume, the dissertation meets the requirements of the regulations for the application of the Law on the Development of the Academic Staff in the Republic of Bulgaria. The dissertation submitted for review covers over 140 pages, and structurally includes: *introduction, four chapters, list of the used literature (36 information sources: 18 in Cyrillic; 7 in Latin and 18 websites)*. The textual part of the dissertation is supported by 28 figures and 3 appendices.

The author has chosen the abbreviated form of the *introductory part* to introduce the essence of the dissertation. It is characterized by brevity. However, it needs a better stylistic arrangement and smoothing of the wording (the note refers to the entire dissertation).

In **Chapter One**, entitled **Formulation of the Issue**, which is definitely the theoretical basis of dissertation (destructured in 11 paragraphs), the PhD candidate Todor Todorov researches and comments on historical, theoretical-methodological and organizational aspects of the methodology for physical training of rope access technicians. My overall assessment is positive. It is clear enough, however, that the subject should be enlarged on up to paragraph 1.6. *Possibilities for implementing programs and methods for physical training of human resources in the field of high technologies.*

In the context of the above, attention should be paid to the content of paragraph 1.3. *Professional characteristics of professions with the use of rope access technology.* The emphasis is on reaching, i.e. the access to the place where a specific highly skilled professional activity x or y that requires other competencies, skills and habits of the height technicians, is to be performed. Therefore, the proposed professiographic characterization is incomplete and needs further refinement (probably in subsequent publications on the subject).

The remaining paragraphs related to the types of training are didactic paradigms (from paragraph 1.7 to 1.10), which stand too far from the purpose and subject of the dissertation. This matter can be the subject of another scientific study, in the otherwise too wide area of issues related to the training of rope access technicians.

At the end of the first chapter, the **working hypothesis** is drawn, as the traditional prelude to the methodological part of the dissertation. It stems from the assumption that the purposeful implementation of a specialized methodology (defined as experimental in the dissertation), ... *will contribute to the development of certain motor skills of rope access technicians, which are necessary for the correct and safe implementation of the work process.*

The general reading of the text sufficiently guides us to what it is about; however, from a sportology point of view, the use of the concept *abilities* is contradictory to the dissertation topic, as the concept of **physical preparation** is unconditionally specified there, from which it can be concluded that it is a question of *physical qualities*.

The second chapter entitled “**Aim, tasks, organization of the study and methodology for physical training**”, represents the methodological part of the work.

In the current version of the dissertation, the methodological concept of the study is successfully presented, where the methodological basis and the main approaches for solving the study tasks are specified. There are well-formulated elements necessary for such type of work, i.e. *subject, object, goal, tasks, thesis, methodological apparatus, limitations*. Based on the highlighted subject and

object of the study, the author correctly formulates the purpose of the dissertation: ***research, development and verification of an innovative author's program and methodology for specific physical training of people employed in professions that require the implementation of the "Rope Access" technology.***

The main tools of the study are the sports pedagogical observation and sports pedagogical experiment.

The purposeful use of the functional and anatomic analysis (paragrapg 2.2.3, pages 55-56) deserves support for solving the third study objective, i.e. to reveal the main (priority) muscle groups in height work operations.

PhD candidate Todor Todorov has uses a combination of 6 motor tests (see Table 4) to study the motor qualities of height technicians. The selected tests are distinguished by a high degree of reliability. The "two-rope self-ascending" test is fundamental for the purpose and tasks of the study. The obtained empirical data were processed using the SPSS 23 statistical program. The representative sample consisted of 42 men (meeting certain inclusion criteria: *job experience in rope access between 3-10 years; completed rope access course level 1 to 3; willingness to participate in a physical training program for rope access technicians*), randomly assigned to two groups. The control group consisted of 19 people, and the experimental group consisted of 23 people.

The study was conducted over a 3-year period: between 2019-2021.

The **third chapter** of the dissertation is devoted to the analysis of the obtained empirical results of the study. The analyzes are correct and follow the order of the identified tasks.

Fourth chapter. Conclusions and recommendations.

The intermediate summaries and comments lead logically to **4 conclusions:**

1. *The test battery developed and tested by us adequately evaluates the necessary physical qualities for rope access work.*
2. *The complex approach used for training the grip strength, strength and endurance of the upper limbs is an effective way to develop these qualities in height technicians in view of their work activities.*
3. *The inclusion of targeted exercises to improve the status of the trunk muscles and the explosive power of the lower limbs help optimize the work process.*
4. *The combination of classic methods for developing general endurance and high-intensity circuit training for large muscle groups is a good method for influencing the endurance in height technicians.*

and 3 recommendations:

1. *Before starting a course to obtain or increase the qualification, trainers should test and assess the physical capacity of the candidates. We make the same recommendation to the future employers of the course participants.*

2. *During the training, participants should be informed about the importance of physical fitness for the work process and be trained in targeted exercises to improve it.*

3. *Employers should stimulate the motor activity of height technicians during the off-season.*

3. In regard to the abstract: it meets the generally accepted requirements. The abstract sufficiently presents the methodological concept and instrumentation of the dissertation study, the analyzes of the obtained results and the summarized conclusions and recommendations. It presents the author's formulation of the contributions of the dissertation work:

- An in-depth analysis of the positive and weak aspects of the data from the literature review was made, the unsolved problems related to the physical training of hight technicians were clarified.
- An original, science-based methodology for developing the motor skills of height technicians, fully tailored to their work technique, was approved and applied in practice.
- An algorithm of a comprehensive methodology for the motor qualities diagnosis has been developed, which provides a sufficiently good and adequate assessment for their objectification in hight technicians.
- The “self-ascending” height technique has been modified as a test to assess the general physical fitness of height technicians, and has been approbated in the course of the study.

Three independent publications by the PhD candidate Todor Todorov are quoted in the abstract. All of them are thematically related to the content of the dissertation.

4. Critical notes and recommendations to the PhD candidate

- There are too many grammatical deviations and inappropriate stylistic constructions in the dissertation work. I recommend that the PhD student adhere to the academic writing requirement in the present historical tense.
- A significant drawback is the lack of precision in the synthesis of generalizations to individual paragraphs or chapters of the dissertation, or of some essential conclusions, for example, regarding the necessary holistic assessment of the innovative experimental methodology for physical training of hight technicians.

5. Conclusion. The dissertation proposed for review, entitled *„Methodology of Physical Training of Rope Access Technicians”*, developed by the PhD candidate Todor Minkov Todorov, meets the scientometric requirements for a similar genre of scientific communication. Despite some deviations from the requirements and standards for academic writing, there is sufficient scientific

evidence that the purpose of the dissertation study has been achieved. Relevant scientific contributions have been outlined. Based on all abovesaid, my evaluation of the dissertation work as a whole is positive. The achieved scientific results give reason to confidently recommend to the Scientific Committee to give a positive vote to Todor Minkov Todorov, PhD student at the “Tourism, Mountaineering and Orienteering” Department, “Public Health, Healthcare and Tourism” Faculty at the National Sports Academy and award him PhD educational and scientific degree in Higher Education Area: 7. Healthcare and Sports, Professional Field: 7.6. Sports, PhD program “Theory and Methodology of Sports Science”.

November 28, 2022
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Reviewed by:
Prof. Malcho Malchev, PhD